

Exhibit 13

MOLLY D. MCKAY, P. C.
Molly D. McKay
Patent, Trademark & Copyright Attorney
3207 East 22nd Street
Tulsa, Oklahoma 74114-1823
<http://www.mckaypatents.com>

Telephone (918) 742-5900

Facsimile (918) 742-5901

July 28, 2005

LAW OFFICE OF KAREN DANA OSTER, LLC
PMB 1020
15450 SW BOONES FERRY ROAD #9
LAKE OSWEGO OR 97035

Re: 2nd Protest filed on U.S. Patent Application No. 10/806,775

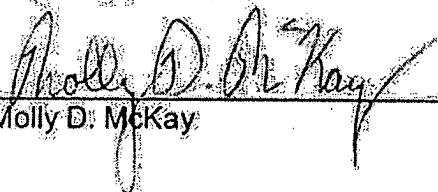
Dear Ms. Oster:

Enclosed is a copy of the above referenced protest that was filed today with the U.S. Patent Office.

Although this protest is being filed after the subject application has been published, and therefore the Patent Office will not institute the protest, we understand that because of Applicant's ongoing duty of disclosure to the Patent Office, the Applicant will be required to submit this information to the Patent Examiner as a part of the prosecution of this patent application.

Enclosed is a second set of references cited in the protest for your convenience in submitting this information to the Patent Office.

Very truly yours,


Molly D. McKay

MDM:mdm
Enclosures

[F:\Linda's Docs\AA\ON\1 to attorney for Applicant accompanying service of Protest]

Law Office of
Karen Dana Oster, LLC
Received

AUG 03 2005

H 001896

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Name of Applicant: Lawrence G. Hopkins

Application No: 10/806,775

Filing Date: 03/22/2004

Title of Invention: FAN ARRAY FAN SECTION
IN AIR HANDLING SYSTEMS

Group Art Unit No: 3745

Examiner: Ninh H. Nguyen

Current status and location: Published in the U.S. on Sept. 23, 2004 as Publication
No. U.S. 2004/0185771 A1; Request for Continued
Examination (RCE) and Amendment filed on June 14, 2005

PROTEST UNDER 37 CFR 1.291(a)

ATTN: Office of Petitions
Assistant Commissioner for Patents
PO Box 1450
Alexandria VA 22313-1450

Dear Sirs:

Enclosed is a self addressed postcard for an acknowledgement by the Patent
Office that this protest has been received.

This protest under 37 CFR 1.291(a) is being filed on the above referenced
patent application, serial number 10/806,775. Attached is form PTO-1449 with a
listing of the pertinent references provided with this protest. Copies of each of the
listed references are also attached. These references are being submitted to show
that the invention which is the subject of U.S. patent application no. 10/806,775, as

I HEREBY CERTIFY THAT THIS PAPER OR FEE IS
BEING DEPOSITED WITH THE UNITED STATES
POSTAL SERVICE AS FIRST CLASS MAIL UNDER 37
CFR 1.8 ON THE DATE INDICATED BELOW AND IS
ADDRESSED TO: ATTN: OFFICE OF PETITIONS,
ASSISTANT COMMISSIONER FOR PATENTS, PO Box
1450, Alexandria VA 22313-1450.

DATE OF DEPOSIT: July 28, 2005
Molly D. McKay Reg. 35,609

TYPED OR PRINTED NAME OF PERSON MAILING:
Molly D. McKay
SIGNATURE OF PERSON MAILING FEE OR PAPER:

currently amended, was, under 35 U.S.C. 102(b), in public use or on sale in this country more than one year prior to the date of the application for patent in the United States. The filing date for U.S. patent application no. 10/806,775 was the filing date of provisional application no. 60/456,413, filed on March 20, 2003. Thus, the critical date for purposes of the one year prior use date is March 20 2002. A concise explanation of the relevance of each of the listed references appears below:

The first reference is a worksheet and drawing by AAON, Inc. in Tulsa, Oklahoma that was prepared for its customer, Borders Group, Inc. under the job name of Borders East Towers. The worksheet is dated February 26, 2001 and the drawing is dated 02/06/2001. This reference shows 1) the use of multiple plenum fans, i.e. four fans; 2) airway path less than 72 inches; and 3) spacing between fan units that is less than 60% of the fan wheel diameter.

The second reference an order form, estimating worksheet, and facsimile transmission from AAON to its customer, Bovis Construction Company under the job name of The Commons. The order form is dated 9/15/98, the estimating worksheet is dated 9/30/98, and the facsimile is dated 6/30/98. Each sheet of this reference shows that this job would include perforated liners or perf. liners. These perforated liners are acoustically absorptive insulation surface provided on the fan unit chamber.

REDACTED

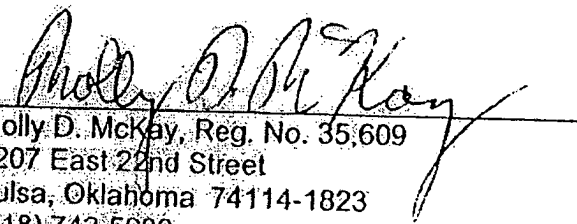
The third reference is wiring diagram assignment and verification by AAON for its customer Frey Lutz Corporation under job name Farm Show Arena. Although the reference is dated 01 Apr 2002, it indicates a lead date of 12/27/01 for this job. This reference shows use of backdraft dampers with fan units.

The fourth reference is worksheet and associated drawing by AAON for its customer Jacco Associates under job name Harrison Hills. The worksheet is dated February 26, 2002 and the drawing is dated 02/26/2002. The reference shows a blow through design where the air handling system conditions the air within the unit and the fans push the air through the unit.

The fifth reference is an AAON document entitled RL Feature Master-Feature Number showing different options available to customers from AAON. The reference is shown with an update date of 10/17/01. Under 1st Feature -Return Outside Air Options, B Feature-R/A Blower Config., options E, F, and G show fans that can be operated independently with separate variable frequency drives (VFDs).

The sixth and final reference is a Mammoth Selection Guide for Custom Penthouse (200-410 Tons, Cooling-only VAV configurations). This reference bears a copyright date on the back page of 1992. On page 8 of the reference, a unit having six (6) fans is offered for sale. On page 11 of the reference, a unit having three (3) vertical fans is offered for sale.

Respectfully submitted,

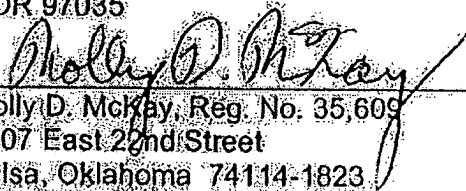

Molly D. McKay, Reg. No. 35,609
3207 East 22nd Street
Tulsa, Oklahoma 74114-1823
(918) 742-5900
Attorney for AAON, Inc.

Enclosures: self addressed postcard
PTO-1449 with 6 references
Proof of Service on Applicant's Attorney

CERTIFICATE OF SERVICE

A copy of this Protest with attachments was served according to 37 CFR 1.291(a) (2) and 37 CFR 1.248(a)(4) on the attorney for Applicant Lawrence G. Hopkins via U.S. first class mail on July 28, 2005 at the following address:

Law Office of Karen Dana Oster, LLC
PMB 1020
15450 SW Boones Ferry Road #9
Lake Oswego, OR 97035


Molly D. McKay, Reg. No. 35,609
3207 East 22nd Street
Tulsa, Oklahoma 74114-1823
(918) 742-5900
Attorney for AAON

[F:\Linda's Docs\AAON\Huntain 2nd Protest]

PTO/SB/08a (08-03)

U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE
to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Application Number	10/806,775
Filing Date	03/22/2004
First Named Inventor	Hopkins, Lawrence G.
Art Unit	3745
Examiner Name	Ninh H. Nguyen
Attorney Docket Number	Hunt-Fan-Att-1

U. S. PATENT DOCUMENTS

FOREIGN PATENT DOCUMENTS

Examiner
Signature

*EXAMINER: Initial if reference considered; whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. 3 Enter Office that issued the document; by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbol; as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

H 001901

PTO/SB/086 (08-03)

Approved for use through 06/30/2008; OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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Substitute for form 1449B/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Sheet 2

of 2

Complete if Known:

Application Number	10/806,775
Filing Date	03/22/2004
First Named Inventor	Hopkins, Lawrence G.
Art Unit	3745
Examiner Name	Ninh H. Nguyen
Attorney Docket Number	Hunt: Fan Arr I

NON PATENT LITERATURE DOCUMENTS:

Examiner Initials*	Cite No.†	Include name of the author (in CAPITAL LETTERS); title of the article (when appropriate); title of the item (book, magazine, journal, serial, symposium, catalog, etc.); date; page(s); volume/issue number(s); publisher; city; and/or country where published.	T‡
		AAON worksheet and drawing regarding Borders East Towers job for customer Borders Group; Dated 2/26/2001 and 2/6/2001; Tulsa, OK	
		AAON order form, estimated worksheet and facsimile transmission regarding The Commons job for customer Bovis Construction Company; Dated 9/15/98, 9/30/98, and 6/30/98; Tulsa, OK	
		AAON wiring diagram assignment and verification regarding Farm Show Arena job for customer Frey Lutz Corporation; Dated 4/1/02 and bearing a lead date of 12/27/01; Tulsa, OK	
		AAON worksheet and drawing regarding Harrison Hills job for customer Jacco Associates; Dated 2/26/02 and 2/26/02; Tulsa, OK	
		AAON RL Feature Master-Feature Number sheet; Dated 10/17/01; Tulsa, OK	
		MAMMOTH Selection Guide for Custom Penthouse (200-410 Tons Cooling-only VAV configurations); 1992; Minneapolis, MN	

Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

†Applicant's unique citation designation number (optional). ‡Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

H 001902

AAON, Inc.**Worksheet**

2426 South Yukon Ave. Tulsa, Oklahoma 74107-2728 • Ph. (918) 583-2200 Fax (918) 583-6094

AAONSer32 Ver. 4.08 Beta

RL-075-3-0-AA04-000:A000-E00-JAZ-A0A-GA0ADBJ-00-00000000X
 Tag: 3 West

Job Name:
 Job Number:

Borders East Tower
 Job #2

Worksheet For:
 Worksheet Date:

Borders Group Inc.
 February 26, 2001

	Base Option	Description	List Price	Rep. Price	Cust. Price
R	Series	Roof Top Unit			
L	Generation	Eighte Generation			
075	Size	Seventy Five			
3	Voltage	460V/30/60Hz			
0	Interior Protection	Standard			
A	Cooling Style	Draw Thru - R22 Dual Circuit Compressor			
A	Cooling Configuration	Air Cooled Cond w/ 4R Coil High CFM			
0	Cooling Coating	Std			
4	Cooling Stages	4 Stage			
0	Heating Type	No Heat			
0	Heating Designation	No Heat			
U	Heating Stages	No Heat			

	Feature Option	Description	List Price	Rep. Price	Cust. Price
A	1A. Outside Air Options	Economizer			
0	1B. RA Blower Configuration	Std (No return or exhaust blower)			
0	1C. RA Blower	Std (No return or exhaust blower)			
0	1D. RA Motor	Std (No Motor)			
E	2. Outside Air Controls	DDC Econ Control			
0	3. Discharge Location	Bottom Discharge			
0	4. Return Location	Bottom Return			
J	5A. SA Blower Configuration	2 Blowers w/ (Prem off mtr) w/ 1-VFD			
A	5B. SA Blower	Blower A (27" Diameter)			
Z	5C. SA Motor	30.0 hp (1760 rpm)			
A	5D. Pre-Filter	4" Pleated			
0	5E. Final Filter	Std			
A	5F. Filter Options	CPS Pre Filter			
G	7. Refrigeration Controls	4 MTDR On & Off + 115V Outlet Factory Wired			
A	8. Refrigeration Options	Hot Gas Bypass Lead Stage (HGB)			
0	9. Refrigeration Accessories	Std			
A	10. Power Options	225 Amps Power Switch			
D	11. Safety options	R/A & S/A Smoke Detector			
B	12. Controls	Phase & Brown Out Protection			
J	13. Special Controls	Factory Installed DDC Controls by Others			
0	14A. Pre-Heat Configuration	Std (No Preheat)			
0	14B. Pre-Heat Sizing	Std (No Preheat)			
0	15. Option Boxes	Std			
0	16. Cabinet Options	Std			
0	17. Cabinet Options	Std			
0	18. Customer Code	Std			
0	19. Code Options	Std ETL USA Listing			
0	20. Unit Splits	Std (One Piece Unit)			
0	21. Evap & Water Condenser	Std (No Evap or Water Condenser)			
0	22. Blank	Std			
X	23. Type	Special Price Authorization & Gray Paint			
		Subtotal			
		Quantity			
		Total			

H 001903

H 001904

SHIP ON 1/8/99

AAON, Inc.

2425 S. Yukon • Tulsa, OK 74107 • Ph: (918) 583-2266 • Fax: (918) 583-6094

DATE:

9/15/98

PAGE

of

Order Form

SOLD TO:	BOVI'S CONSTRUCTION CORP	CUSTOMER P.O. No.	JOB No.
	PRINCETON FORESTAL VILLAGE	JOB NAME: THE COMMONS	
SHIP TO:	100-200 VILLAGE BLVD.	CUSTOMER No.	AAON CONTACT: J. BARRERA
	PRINCETON, N.J. 08540	SHOP ORDER No. 194639	CUST. CONTACT: K. GARDINER
	(will advise)	REP. #1: 757	REP. #2:
		SHIPPING INFORMATION	
		REQ. SHIP DATE:	HOLD FOR APPROVAL <input type="checkbox"/> RELEASE TO PRODUCTION <input type="checkbox"/>
		SHIP VIA: FAT ALLOWED	
		NOTIFY: <u>ALLOWED</u>	PPD & ADD ACTUAL <input type="checkbox"/> COLLECT <input type="checkbox"/>
		48 HOURS BEFORE DELIVERY @ PHONE No. 609/419-1380	

QTY	PART NO.	DESCRIPTION	Unit Net Ea.	EXT.
6	RIFUR-2 FD-IDL: N1 L1 L1 T1 P1 G1 G1 T1 P1 A1 A1 X	CFM ESP WIRE ① TALK 1A 2A 3A 4A 1B 4 3B		
		③ 46,500 CFM @ 2.75 ESP ④ 9EE NOTES		
		④ 7.5 HP VFD ON PROP EXHAUST		
		R()		
		CFM ESP ⑤ WINE ALL ANALOGUE		
		SIGNALS TO LVTB ⑥ LEAVE 12 INCH X		
		12 INCH AREA IN CONTROL BOX FOR FIELD CONTROLLER		
2	RIFUR-3 FD-IDL: N1 L1 L1 T1 P1 G1 G1 T1 P1 A1 A1 X	CFM ESP WIRE ① TALK 5A 4 5B ② 46,500 CFM		
		③ 2.75 ESP ④ 9EE NOTES ⑤ WINE ALL		
		ANALOGUE SIGNALS TO LVTB ⑥ LEAVE		
		R()		
		CFM ESP 12 INCH X 12 INCH AREA IN CONTROL		
		BOX FOR FIELD CONTROLLER		
		R()		
		CFM ESP		

1,200 FT P 61980

N/C

NOTE ① SPECIAL EVAP COILS (SEE 90A)
 → ② PERFORATED BLINDS IN SUPPLY AIR
 ③ INSTALL CUSTOMER FURNISHED
 TEMP SENSORS - Q/A - R/A - MIXED AIR
 ④ PERSONAL SHIP BY 1/8/98
 ⑤ FURNISH X Multiplier .35

REP. CONTACT:

INSTALL DP SWITCH

TOTAL NET (Rep. Cost) \$

FREIGHT

COMMISSION

TOTAL BILLING

ORDERED BY:

FOR SUPPLY FAN STATUS

⑥ FURNISH X INSTALL ISOLATION

NO PO ON PO# DELAYS FOR CHG. & N.Y.C. CH. I.E.

H 001905

10/01/1998 08:12 7329810939

GIL BAR SALES

PAGE 02

AAON, Inc.

Tulsa, Oklahoma • Ph: (918) 583-2268 • Fax: (918) 583-6094

Estimating WorksheetDATE: REVISION 9/30/98 PAGE 2 of 9

NOTE: THIS WORKSHEET IS FOR ESTIMATING PURPOSES ONLY AND IS NOT INTENDED FOR ORDER PROCESSING.

MARK • RTU No. 1A...MARK • RTU No. 5A...

MARK • RTU No. _____

MARK • RTU No. _____

MODEL	R	SERIES
	F	
	110	UNIT SIZE
	3	VOLTAGE
NUMBER	E0	COOLING
	BASE UNIT PRICE \$	
NUMBER	101	HEATING
	HEATING PRICE \$	
FEATURE	OPTION	LIST PRICE
	1. OUTSIDE AIR	
	2. BLOWER MFL	
	3. FILTER OPT.	
	4. RETURN CIL	
	5. RETURN OPT.	
	6. POWER MFL	
	7. SAFETY OPT.	
	8. CONTROL OPT.	
	9. SPECIAL CIL	
	10. SHDN	
	11. COOL OPT.	
	12. CABINET OPT.	
	13. SYSTEM PHL	
14. TYPE		
TOTAL UNIT LIST PRICE \$		

MODEL	R	SERIES
	F	
	120	UNIT SIZE
	3	VOLTAGE
NUMBER	F0	COOLING
	BASE UNIT PRICE \$	
NUMBER	101	HEATING
	HEATING PRICE \$	
FEATURE	OPTION	LIST PRICE
	1. OUTSIDE AIR	
	2. BLOWER MFL	
	3. FILTER OPT.	
	4. RETURN CIL	
	5. RETURN OPT.	
	6. POWER MFL	
	7. SAFETY OPT.	
	8. CONTROL OPT.	
	9. SPECIAL CIL	
	10. SHDN	
	11. COOL OPT.	
	12. CABINET OPT.	
	13. SYSTEM PHL	
14. TYPE		
TOTAL UNIT LIST PRICE \$		

MODEL	R	SERIES
		UNIT SIZE
		VOLTAGE
NUMBER		COOLING
	BASE UNIT PRICE \$	
NUMBER		HEATING
	HEATING PRICE \$	
FEATURE	OPTION	LIST PRICE
	1. OUTSIDE AIR	
	2. BLOWER MFL	
	3. FILTER OPT.	
	4. RETURN CIL	
	5. RETURN OPT.	
	6. POWER MFL	
	7. SAFETY OPT.	
	8. CONTROL OPT.	
	9. SPECIAL CIL	
	10. SHDN	
	11. COOL OPT.	
	12. CABINET OPT.	
	13. SYSTEM PHL	
14. TYPE		
TOTAL UNIT LIST PRICE \$		

MODEL	R	SERIES
		UNIT SIZE
		VOLTAGE
NUMBER		COOLING
	BASE UNIT PRICE \$	
NUMBER		HEATING
	HEATING PRICE \$	
FEATURE	OPTION	LIST PRICE
	1. OUTSIDE AIR	
	2. BLOWER MFL	
	3. FILTER OPT.	
	4. RETURN CIL	
	5. RETURN OPT.	
	6. POWER MFL	
	7. SAFETY OPT.	
	8. CONTROL OPT.	
	9. SPECIAL CIL	
	10. SHDN	
	11. COOL OPT.	
	12. CABINET OPT.	
	13. SYSTEM PHL	
14. TYPE		
TOTAL UNIT LIST PRICE \$		

CLASS / TYPE	
KD	\$
SB	\$

CLASS / TYPE	
KD	\$
SB	\$

CLASS / TYPE	
KD	\$
SB	\$

CLASS / TYPE	
KD	\$
SB	\$

A	6/14 91.25 DX COIL	6/14 91.25 DX COIL	INCL.
C	PERF LINERS-SUPPLY	PERF. LINER-SUPPLY	#3600
G	MOUNT DDC	MOUNT DDC	1450
S	49" SUPPLY FAN		750 (RTU - 1A... ONLY)
S	EXH. VFD - 7.5 HP	EXH. VFD - 7.5 HP	2750
LIST PRICE EA			
EA	35	35	

98

H 001906

18/01/1998 08:12

7329818939

GIL BAR SALES

PAGE 07

AAON, INC.
2425 South Yukon
Tulsa, Oklahoma 74107
Phone: (918) 513-2266
Fax: (918) 513-6094

~~7/9~~
7/9

AAON, INC.

FAX

TO: Kevin Gabinelli
Gil-Bar

FROM: Natalie Neilson

DATE: 6-30-98

FAX NO: 732-981-0939

PAGES: 1

SUBJECT: RF-130 Special Pricing -- SPA#89008

Kevin,

To provide the RF-150 with perforated liners on the supply section is \$5,600 list add. ←
~~To provide the RF-150 with perforated liners on the return section is \$5,100 list add.~~

I do not have the pricing for the entire unit, so I will have to research this and get back with you.

Also, I don't know what to tell you on the "Sharing ?" job, you really need to discuss this matter with Steve pagetter. Sorry!!!!

This pricing is valid for use within 30 days of this transmission. Please send in a copy of this letter or the SPA number to expedite the process.

Thank you,

Natalie Neilson
Ext. 293

H 001907

BM03L5 AC AAOON, INC. WIRING DIAGRAM ASSIGNMENT

01 Apr 2002 PAGE 1

REQUESTED BY ccox-eng /dev/pts/29

REQUISITION NUMBER: 256816

ORDER INFORMATION

CUSTOMER: FREY LUTZ CORPORATION
 SHIP TO: HARRISBURG, PA 17110
 JOB NAME: FARM SHOW ARENA

LEAD DTE: 12/27/01 SHIP ON : 06/30/02

CONTACT : B. SMITH

SEQ	PART NBR	QTY	DESCRIPTION	DISPOSITION
001	@	0	RL-135-3-0-FZ00-344: A000E00KB2CP0D00A00J0000GB00000X	--no-ENG
002	@	9	RL-230-3-0-0F08-354: BGBE000KELCP0DACE00J0000GR000A0X	EEfint 04/01/02 by CCOX-EN
003	@FREIGHT	1		--no-ENG
004	@REP:780	1		--no-ENG

Sales and Engineering text lines for entire order

-----SALES HEADER INFO-----

NOTE ON JOB SAYS "HOLD FOR
 APPROVAL" (WRITTEN BY JIM
 PARRO)

REVISED OPTION #15 FROM [0] TO
 [A] PER J. PARRO 1/4/02 DS
 3/5 PER BRETT S. SHIP APPROX.
 6/30. JL

PER BUCK NYE SHIP UNITS END OF
 JUNE IF POSSIBLE!!!

-----ENG HEADER INFO-----

-----SALES LINE ITEM # 001-----

1) 38000 CFM @ 1.5 ESP
 2) SUPPLY FAN BACK DRAFT
 DAMPER
 3) SPA #101255
 4) TAG #1

-----SALES LINE ITEM # 002-----

1) 42500 CFM @ 2.25 ESP
 2) SUPPLY FAN BACK DRAFT
 DAMPER
 3) RA FAN PITCH 40"
 4) TAG #1 THRU 9
 5) SPA #101255
 6) 8 ROW DX COILS
 7) (4) COPELAND SCREW
 COMPRESSORS
 8) STAINLESS STEEL CONDENSER
 FAN MOTOR SHAFT
 9) 14 GA. BASE SHEETS
 10) BURGLAR BARS ON 3" CENTERS
 11) FACTORY INSTALL CUSTOMER
 PROVIDED CONTROLS
 12) MAKE-UP WATER BACKFLOW
 PREVENTER

RL230
cooling (W/SPA #101255)
1/AS HEAT / 1/255 (1/2 Taker)
2/Power Exhaust w/2VFD's
DDC Eco
2 Supply Fans w/2VFD's
Make-up Water

3.26.2002 10:53AM

JACCO & ASSOCIATES

NO. 9062 P. 7

AAON, Inc.**Worksheet**

8126 South Yukon Ave. Tulsa, Oklahoma 74117-2729 Ph. (918) 583-2266 Fax (918) 583-6054

AAONEscal2 Ver. 4.08 Beta

RL-075-8-0-0B04-000:BCBD-DAF-EAE-000-G00B000-00-00000000B
 Tag: RTU# 1

Job Name:
 Job Number:

HARRISON HILLS
 Job #1

Worksheet For:
 Worksheet Date:

Jacco Associates
 February 26, 2002

	Base Option	Description	List Price	Rep. Price	Cust. Price
R	Series	Roof Top Unit			
L	Generation	Eight Generation			
0.75	Size	Seventy Five			
8	Voltage	208VAC/60Hz			
0	Interior Protection	Standard			
0	Cooling Style	Blow Thru - R32 Dual Circuit Compressor			
B	Cooling Configuration	Air Cooled Cond w/ 8R Coil High CFM			
0	Cooling Coating	Std			
4	Cooling Stages	4 Stages			
0	Heating Type	No Heat			
0	Heating Designation	No Heat			
0	Heating Stages	No Heat			

	Feature Option	Description	List Price	Rep. Price	Cust. Price
B	1A: Outside Air Options	Power Exhaust			
C	1H: RA Blower Configuration	1 Blower (Pram eff mtr)			
B	1C: RA Blower	Blower B (42" Dia 9 Blade)			
D	1D: RA Motor	9.0 hp (1170 rpm)			
D	2: Outside Air Controls	Full Mod Enthalpy Econ			
A	3: Discharge Location	Front Discharge			
F	4: Return Location	Front Return High CFM (w/ ors or pwr ex)			
E	6A: SA Blower Configuration	2 Blowers w/ (Pram eff mtr)			
A	6B: SA Blower	Blower A (27" Diameter)			
E	6C: SA Motor	6.0 hp (1170 rpm)			
0	6A: Pre-Filter	Std Pleated			
0	6B: Final Filter	Std			
0	6C: Filter Options	Std			
G	7: Refrigeration Controls	5 MTDR On & Off - 115V Outlet Factory Wired			
0	8: Refrigeration Options	Std			
0	9: Refrigeration Accessories	Std			
B	10: Power Options	400 Amps Power Switch			
0	11: Safety options	Std			
0	12: Controls	Std			
0	13: Special Controls	Std			
0	14A: Pre-Heat Configuration	Std (No Preheat)			
0	14B: Pre-Heat Sizing	Std (No Preheat)			
0	15: Option Rows	Std			
0	16: Cabinet Options	Std			
0	17: Cabinet Options	Std			
0	18: Customer Code	Std			
0	19: Cdn Options	Std ETL USA Listing			
0	20: Unit Splits	Std (One Piece Unit)			
0	21: Evap & Water Condenser	Std (No Evap or Water Condenser)			
0	22: Blank	Std			
B	23: Type	Std (Includes 'Gray Paint')			
		Subtotal			
		Quantity			
		Total			

H 001909

AAON inc.

TULSA DEALEH/A

Form 3000-16937 / Shipping Weight 16937

Configuration: RL-075-B-0-0004-00000000-000-000-00000000-000-00000000
 JOB NAME: HARRISON HILLS

PURCHASER: ACCO Associates

PURCHASER: GREEN, DEBORAH

Rep. Contact:

Installed by: M.D. Brown

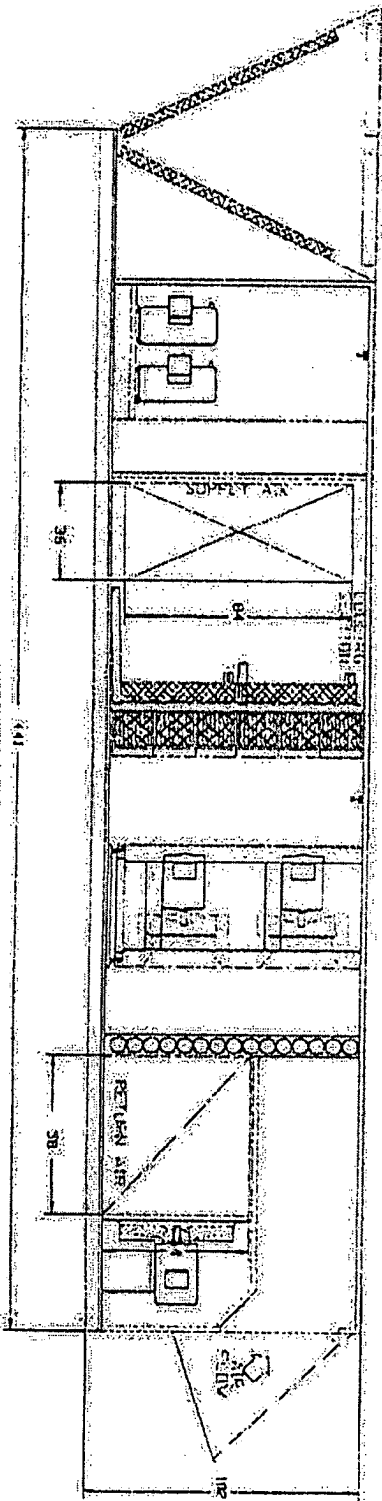
UNIT TAG: RTU1

SERIAL NO.:

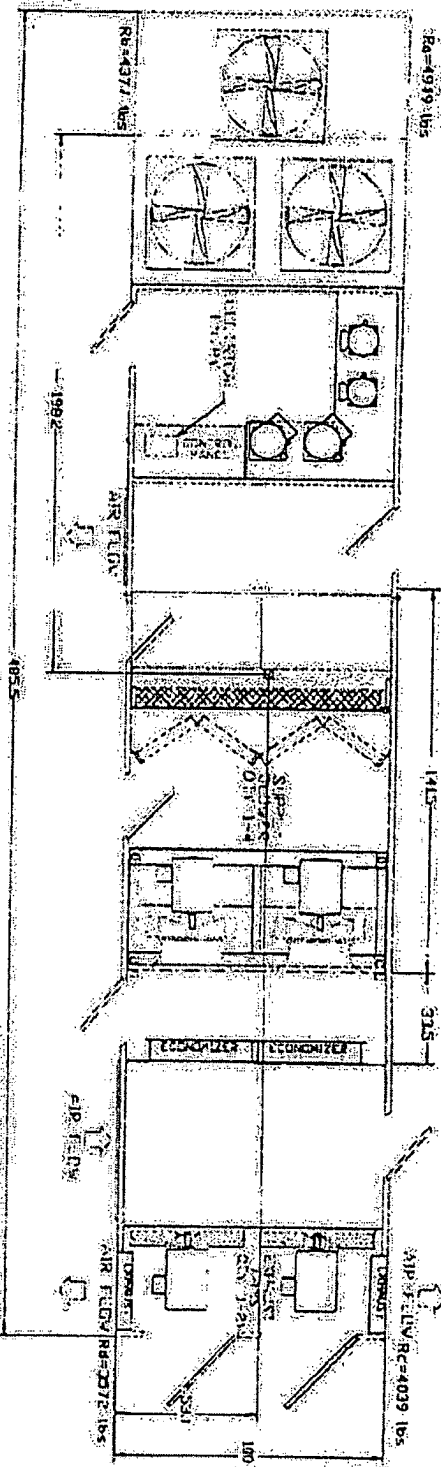
DATE: 02/26/2002

Engineer:

ELEVATION VIEW



PLAN VIEW

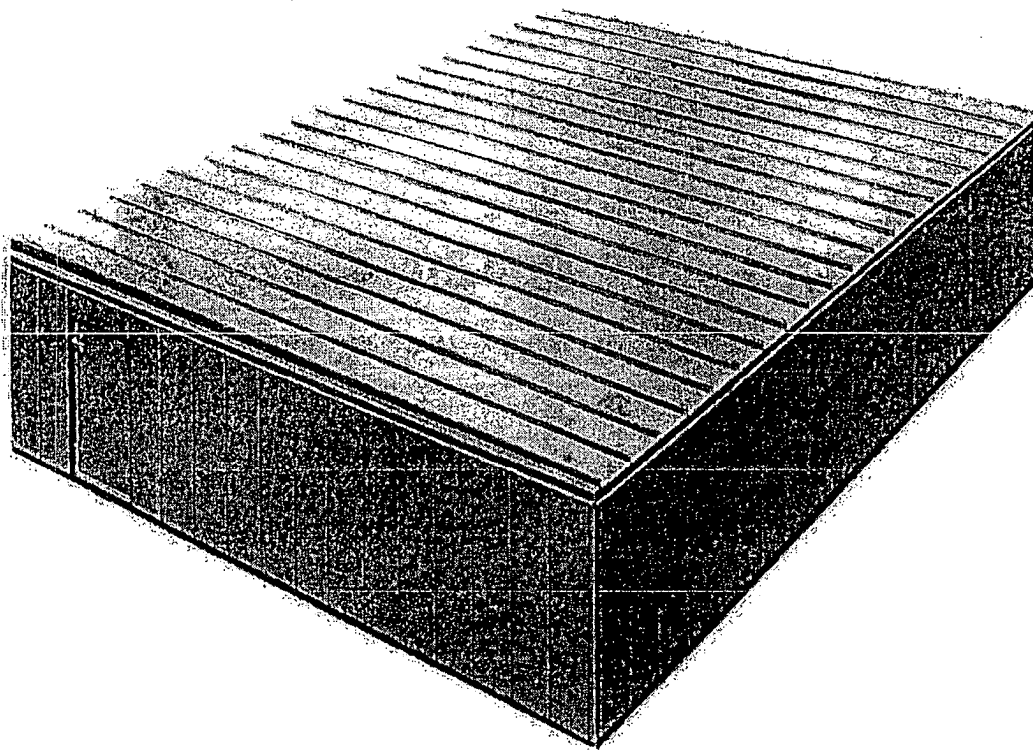


H 001910

Custom Penthouse

200 – 410 Tons

Cooling-only VAV configurations



Selection Guide

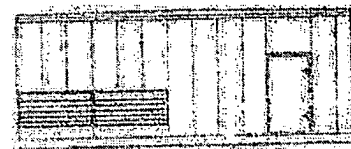
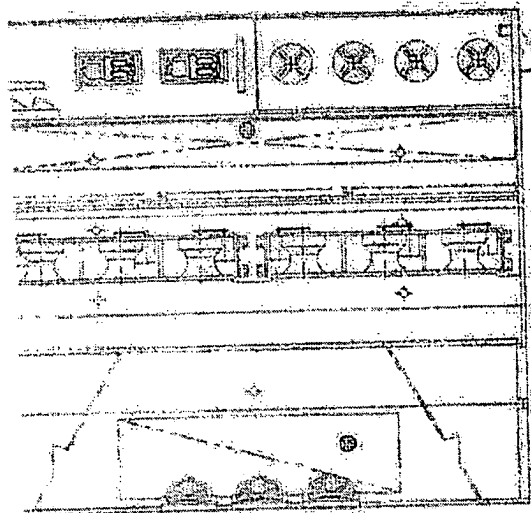
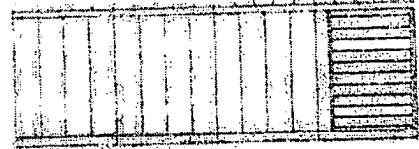
Look into a Mammoth Custom Penthouse for flexibility, efficiency, and reliability

For your next HVAC design, take advantage of lower first costs, shorter construction cycles and time-proven performance. Enjoy complete system flexibility, without the design, procurement and labor costs normally associated with field-built systems.

Specify a Mammoth Custom Penthouse

Mammoth has engineered the Custom Penthouse to meet the conditioning needs of office buildings, retail establishments and warehouse/industrial facilities with cooling requirements from 200 to 600 tons.

The following data provides an overview of Custom Penthouse configurations and performance characteristics available for variable air volume (VAV), cooling-only applications. If your project requires additional capacity or mechanical equipment, the Custom Penthouse can be engineered to satisfy those requisites. After all, the number of possible options ends only when you are satisfied.



H 001913

Custom Penthouse standard features

- ☐ Evaporative condenser with staging/unloading capability
- ☐ York semi-hermetic reciprocating compressors
- ☐ Supply and return fan staging
- ☐ DX cooling and fan redundancy
- ☐ Custom exterior color (air dry)
- ☐ Walk-in service vestibule
- ☐ Full interior service lighting
- ☐ Factory-wired 15-amp GFI convenience outlet
- ☐ Remote unit status monitoring panel
- ☐ Vari-Cone® air modulator
- ☐ Four-inch 30% efficiency filters
- ☐ Low-leakage outside/return air dampers
- ☐ Full economizer control
- ☐ Water treatment interface for condenser
- ☐ Single point main and temperature control
- ☐ Factory certified start-up
- ☐ ETL labeled

Optional features

- ☐ Screw compressors
- ☐ Factory fabricated, field installed curbing
- ☐ Direct digital control (DDC) interface or complete DDC unit controls
- ☐ Acoustical inner liner panels
- ☐ Access stairways
- ☐ Custom-sized DX coils and supply air openings (requires factory confirmation)
- ☐ Fire and smoke sequence of operation
- ☐ Custom remote control panel
- ☐ Factory-certified final field piping/electrical connections

This is just a sampling of options available for the Mammoth Custom Penthouse. For more information, consult your Mammoth Representative.

UNIT PHYSICAL AND NOMINAL PERFORMANCE DATA

MODEL	Propeller Exhaust						Power Return					
	2102	2602	3002	3502	4203	4403	2102	2602	3002	3502	4203	4403
Condenser KW	164.7	199.8	225.0	275.5	315.0	340.4	164.7	199.8	225.0	275.5	315.0	340.4
Unit Total Full Load Amps (460/3/60)	427.0	555.2	591.6	777.8	856.0	890.0	474.0	579.2	627.6	803.8	892.0	944.0
DX Cooling Capacity MBH/Tons Total	2400/200	2940/245	3300/275	3960/330	4560/380	4920/410	2400/200	2940/245	3300/275	3960/330	4560/380	4920/410
Sensible	1825/152	2215/184	2485/207	2985/248	3406/283	3740/311	1825/152	2215/184	2485/207	2985/248	3406/283	3740/311
DX Coil Rows/Fins per Inch	5/10	5/10	5/10	5/10	5/10	5/10	5/10	5/10	5/10	5/10	5/10	5/10
Square Feet	132	157	177	211	241	271	132	157	177	211	241	271
Main Supply Fan Data												
Supply Air CFM	76,000	93,100	104,500	125,400	144,400	155,800	76,000	93,100	104,500	125,400	144,400	155,800
Supply Air TSP (WC)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Supply Air Brake HP/ Actual HP	112/120	128/160	148/160	171/240	204/240	222/240	112/120	128/160	148/160	171/240	204/240	222/240
Power Return Air/ Exhaust Air Fan Data												
Return Air CFM	N/A	N/A	N/A	N/A	N/A	N/A	68,400	83,700	94,000	112,800	129,000	140,200
Return Air ESP (WC)	N/A	N/A	N/A	N/A	N/A	N/A	1.5	1.5	1.5	1.5	1.5	1.5
Return Air Brake HP/ Actual HP	N/A	N/A	N/A	N/A	N/A	N/A	68/60	45/50	55/60	57/60	72/75	83/90
Prop Exhaust Fan Data												
Exhaust Air CFM	68,400	83,700	94,000	112,800	129,000	140,200	N/A	N/A	N/A	N/A	N/A	N/A
Exhaust Air ESP (WC)	0.50	0.50	0.50	0.50	0.50	0.50	N/A	N/A	N/A	N/A	N/A	N/A
Actual HP	22.5	30.0	30.0	37.5	45.0	45.0	N/A	N/A	N/A	N/A	N/A	N/A
Filters (4")												
35% Eff. - Square Feet	167.0	208.0	208.0	267.0	267.0	333.0	167.0	208.0	208.0	267.0	267.0	333.0
Louver/Damper Data												
Outside Air Louver Sq. Ft.	104.0	184.0	184.0	184.0	184.0	184.0	104.0	184.0	184.0	184.0	184.0	184.0
Outside Air Motorized Damper Sq. Ft.	68.0	93.0	93.0	160.0	160.0	160.0	68.0	93.0	93.0	160.0	160.0	160.0
Return Air Motorized Damper Sq. Ft.	66.0	103.0	103.0	163.0	163.0	163.0	66.0	103.0	103.0	163.0	163.0	163.0
Exhaust Air Non- Motorized Damper Sq. Ft.	52.0	69.0	69.0	86.0	104.0	104.0	68.0	75.0	75.0	101.0	101.0	101.0
Size - Length x Width	30' x 25'	37 1/2' x 30'	37 1/2' x 30'	37 1/2' x 45'	37 1/2' x 45'	37 1/2' x 45'	30' x 25'	37 1/2' x 30'	37 1/2' x 30'	37 1/2' x 45'	37 1/2' x 45'	37 1/2' x 45'
Operating Weight (lbs.)	43,967	59,352	59,880	80,216	83,208	84,057	44,924	60,405	61,033	81,935	84,742	85,591

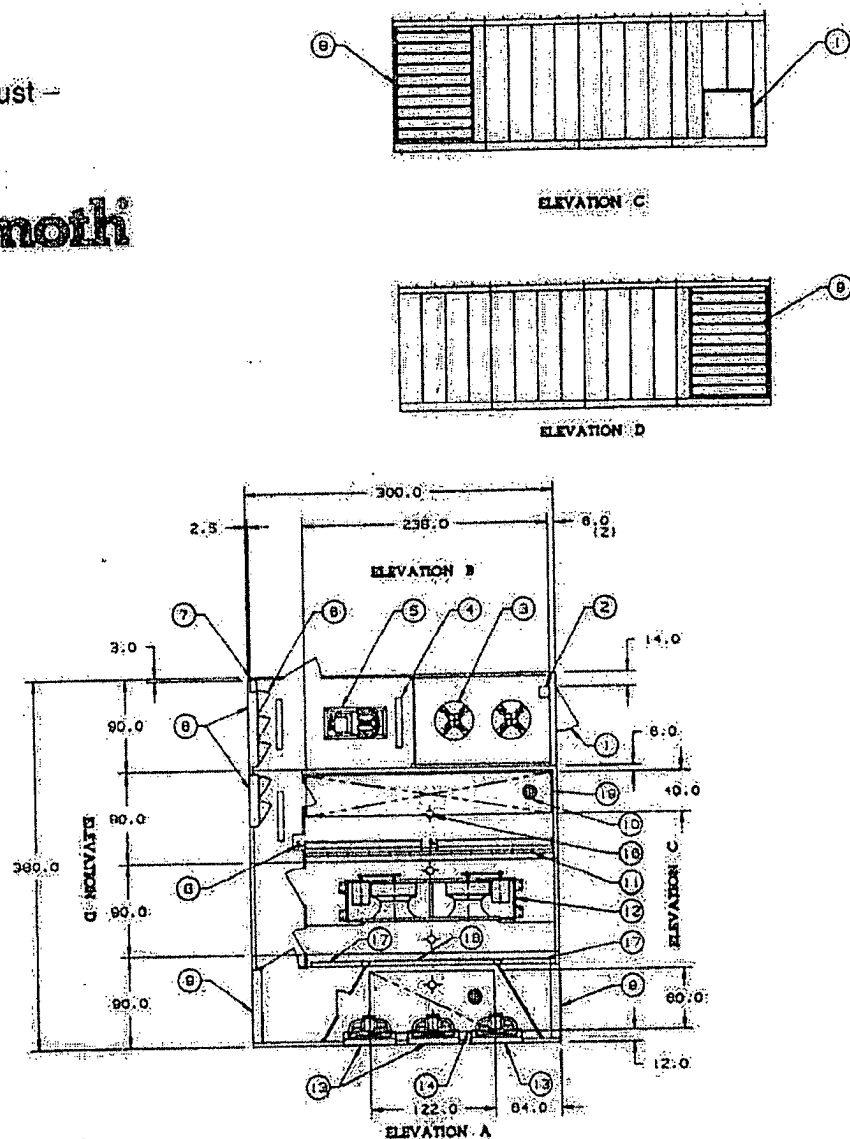
DESIGN CRITERIA

- 1) All data measured at sea level.
- 2) Cooling loads based on 80°/67°F entering air temperature to DX cooling coil.
- 3) DX cooling capacity based on DX saturated suction temperature of 45°F and 78°F entering wet bulb design temperature.
- 4) All data based upon a Custom Penthouse unit height of 10 feet 4 inches only.
- 5) For smaller/larger capacity units, please consult your Mammoth representative.

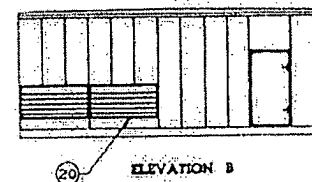
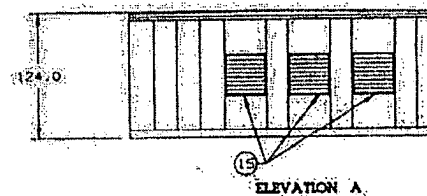
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Propeller Exhaust -
Model 2102

Mammoth



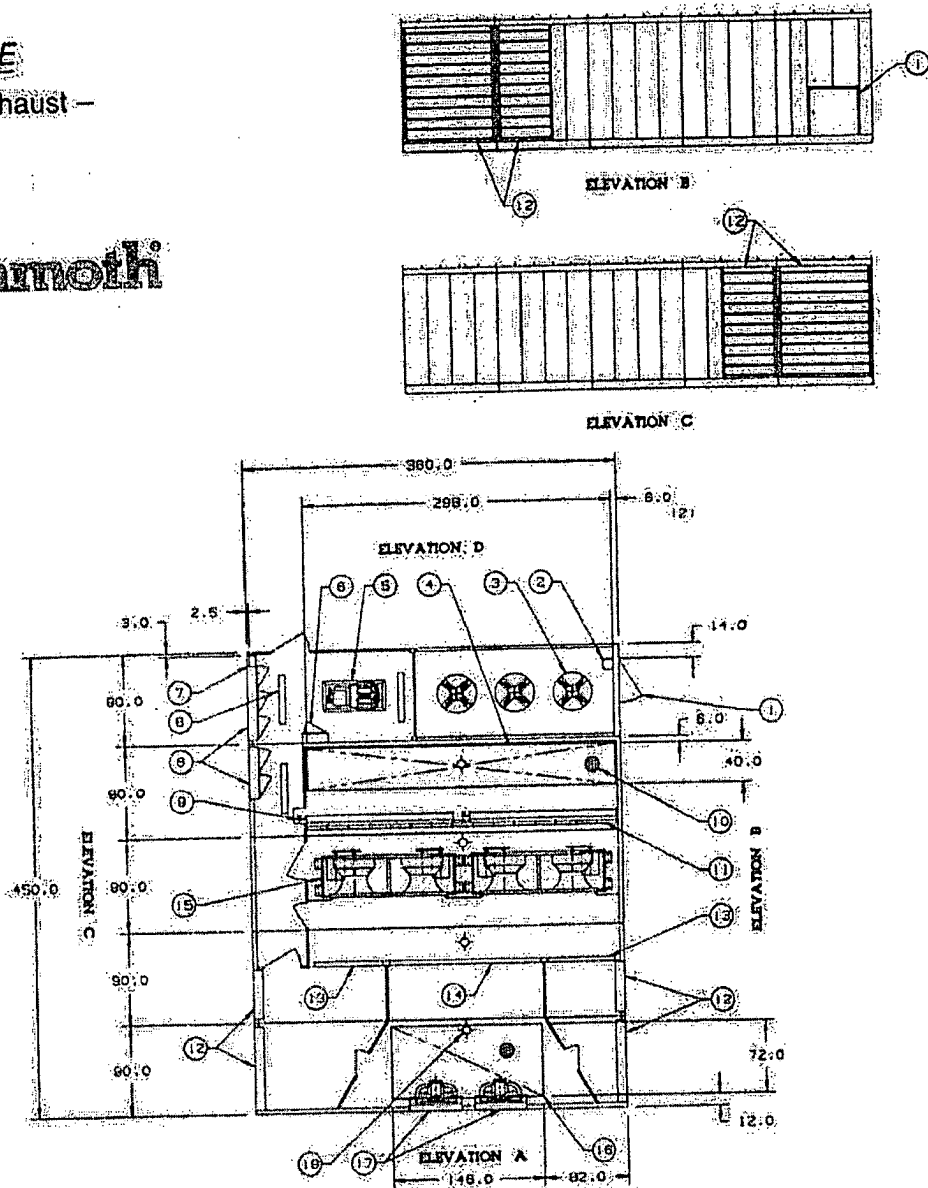
ITEM	DESCRIPTION
1	Sump access
2	10' x 10' Supply and drain water chase
3	Condenser fans
4	Fluorescent lights
5	Compressors
6	Control box
7	6' x 12' Electrical chase
8	Evaporator coils
9	Outside air louvers
10	Bar grate
11	4" filters
12	Main supply fans
13	Prop exhaust fans
14	Return opening
15	Exhaust louvers
16	Incandescent vapor proof lights
17	Outside air dampers
18	Return air dampers
19	Supply opening
20	Sump intake



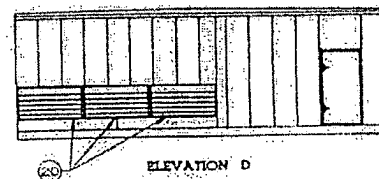
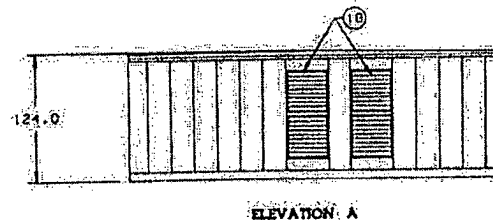
REFERENCE

Propeller Exhaust –
Model 2602
Model 3002

Mammoth



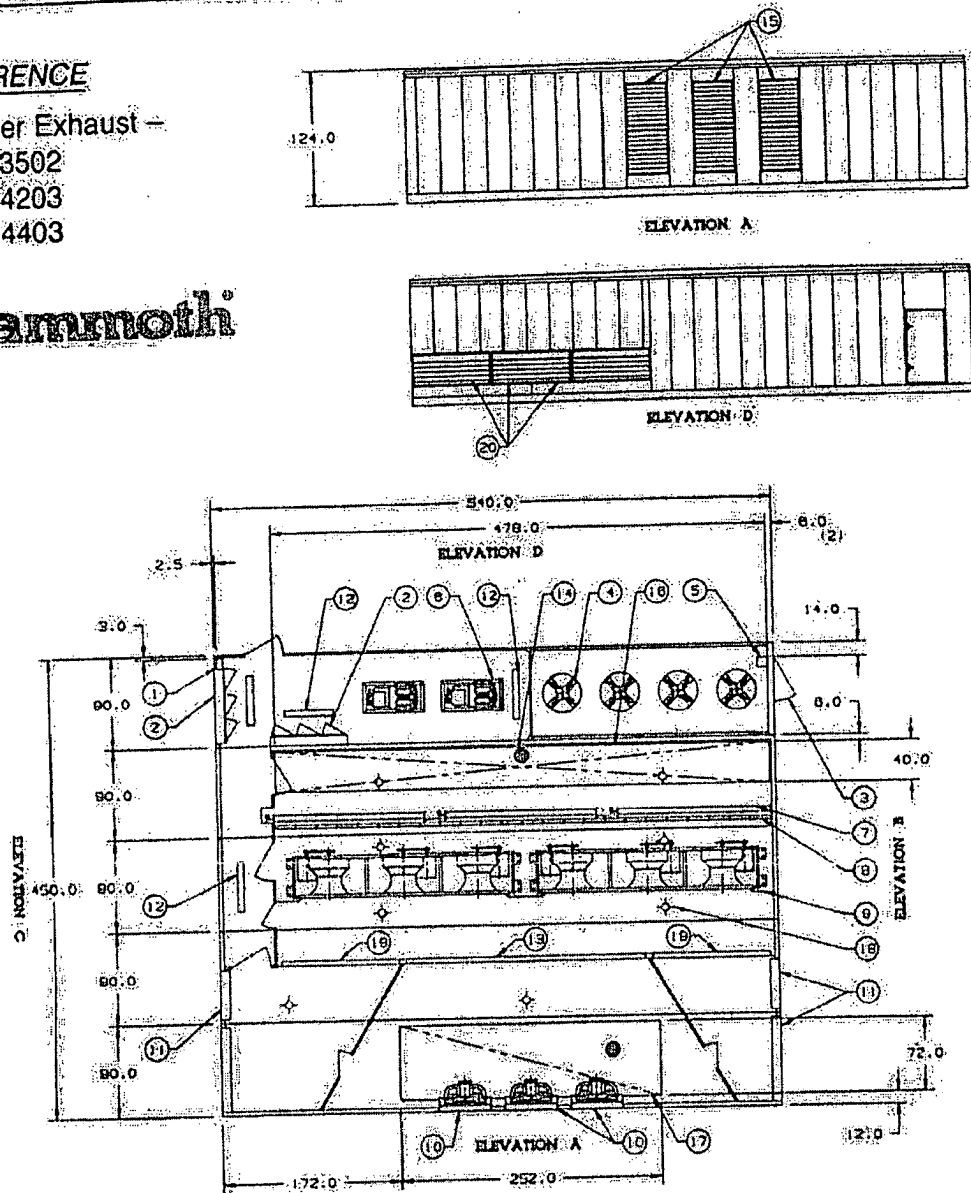
ITEM	DESCRIPTION
1	Sump access
2	10" x 10" Supply and drain water chase
3	Condenser fans
4	Supply opening
5	Compressors
6	Control box
7	8" x 12" Electrical chase
8	Fluorescent lights
9	Evaporator coils
10	Bar grate
11	4" filters
12	Outside air louvers
13	Outside air dampers
14	Return air dampers
15	Supply fans
16	Return opening
17	Prop exhaust fans
18	Exhaust louvers
19	Incandescent vapor proof lights
20	Sump intake



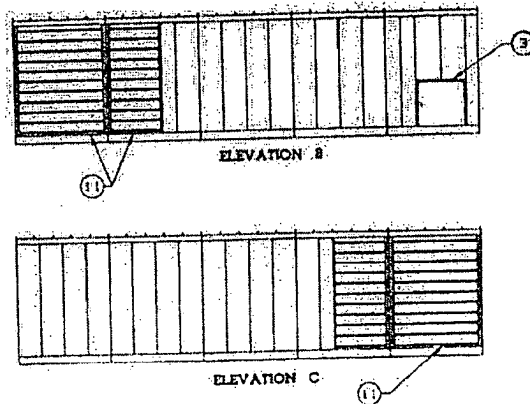
REFERENCE

Propeller Exhaust –
Model 3502
Model 4203
Model 4403

Mammoth®



ITEM	DESCRIPTION
1	6" x 12" Electrical chase
2	Control box
3	Sump access
4	Condenser fans
5	10" x 10" Supply and drain water chase
6	Compressors
7	Evaporator coils
8	4" Filters
9	Supply fans
10	Prop exhaust fans
11	Outside air louvers
12	Fluorescent lights
13	Return air dampers
14	Bar grate
15	Exhaust louvers
16	Supply opening
17	Return opening
18	Incandescent vapor proof lights
19	Outside air dampers
20	Sump intake



REFERENCE

Power Return -
Model 2102

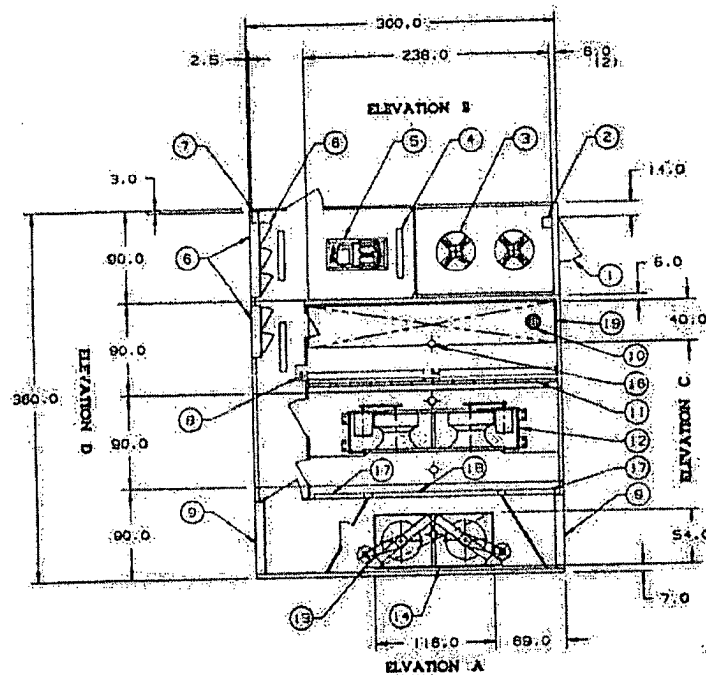
Mammoth



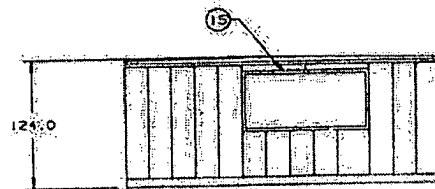
ELEVATION C



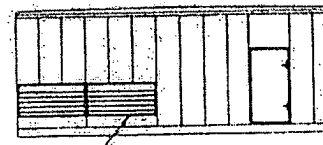
ELEVATION D



ITEM	DESCRIPTION
1	Sump access
2	10' x 10' Supply and drain water chase
3	Condenser fans
4	Fluorescent lights
5	Compressors
6	Control box
7	6' x 12' Electrical chase
8	Evaporator coils
9	Outside air louvers
10	Bar grille
11	4" filters
12	Supply fans
13	Power return fans
14	Return opening
15	Relief panel
16	Incandescent vapor proof lights
17	Outside air dampers
18	Return air dampers
19	Supply opening
20	Sump intake



ELEVATION A



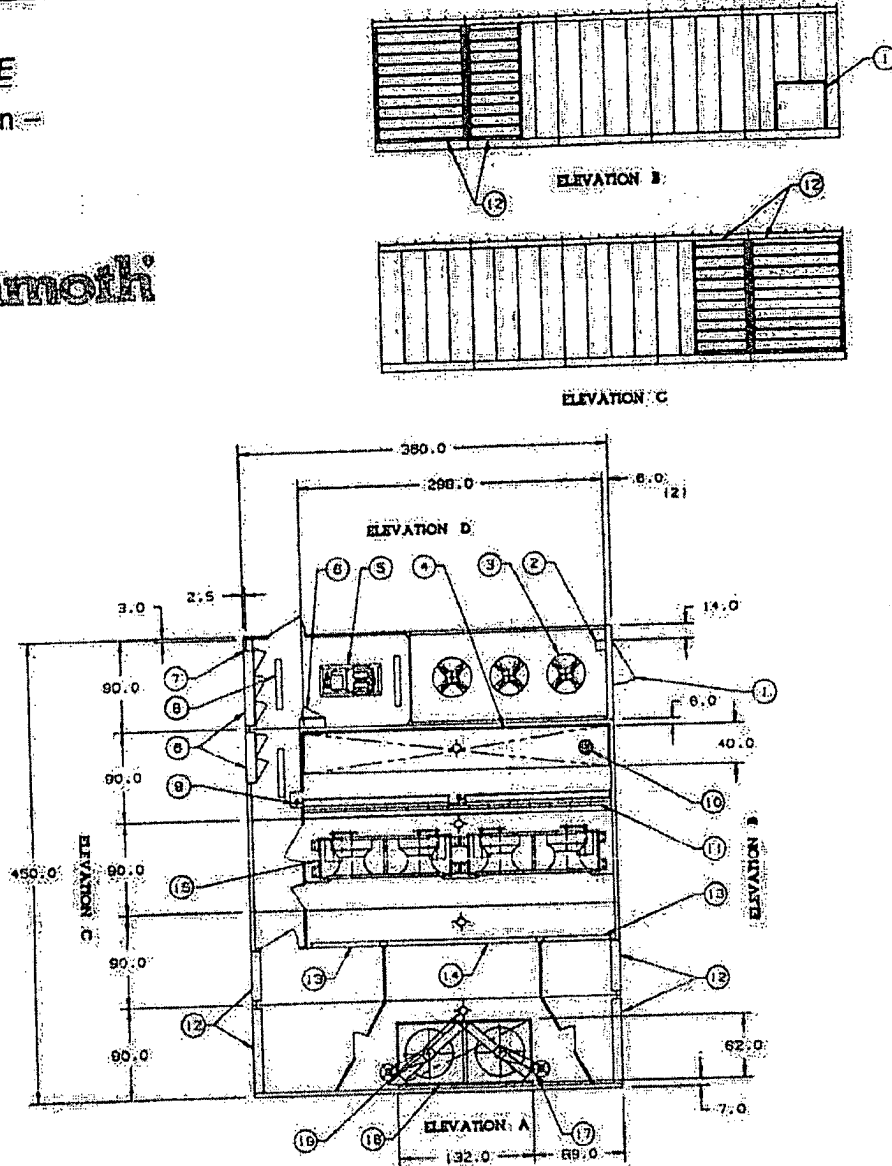
ELEVATION B

REFERENCE

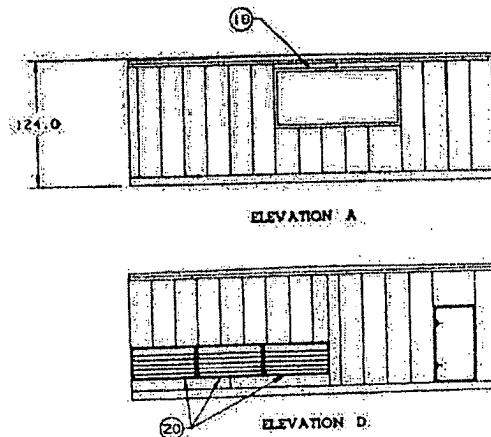
Power Return -

Model 2602

Model 3002

Mammoth

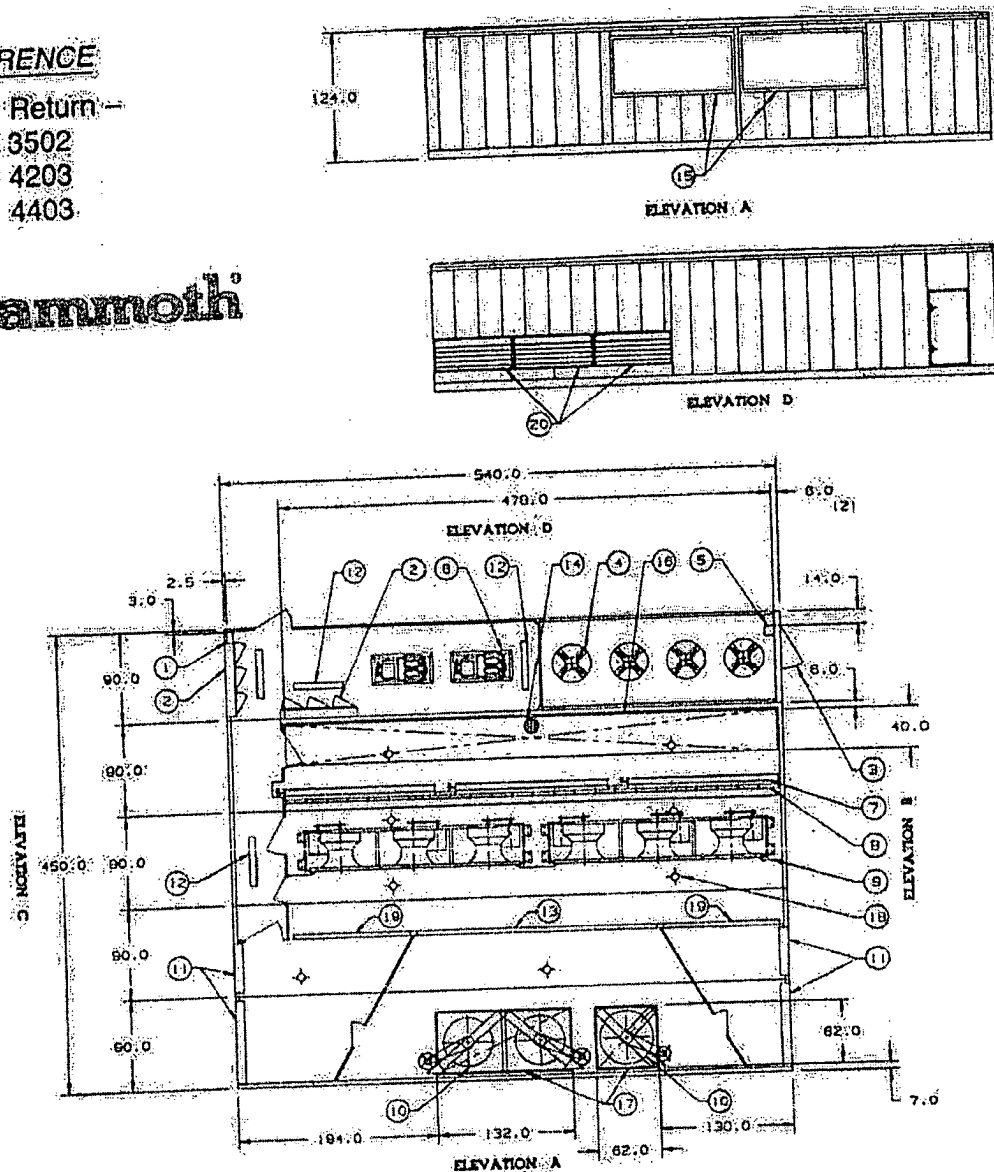
ITEM	DESCRIPTION
1	Sump access
2	10" x 10" Supply and drain water chase
3	Condenser fans
4	Supply opening
5	Compressors
6	Control box
7	6" x 12" Electrical chase
8	Fluorescent lights
9	Evaporator coils
10	Bar grate
11	4" filters
12	Outside air louvers
13	Outside air dampers
14	Return air dampers
15	Supply fans
16	Return opening
17	Power return fans
18	Relief panel
19	Incandescent vapor proof lights
20	Sump intake



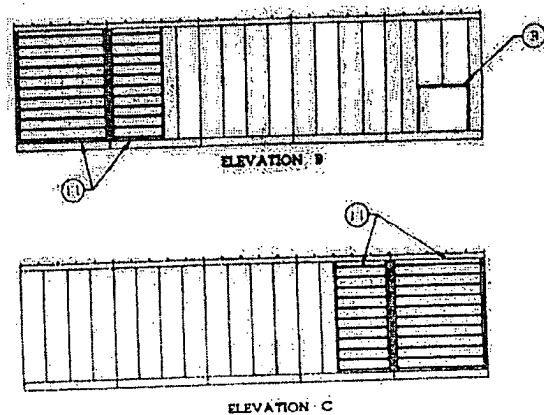
REFERENCE

Power Return —
 Model 3502
 Model 4203
 Model 4403

Mammoth



ITEM	DESCRIPTION
1	6" x 12" Electrical chase
2	Control box
3	Sump access
4	Condenser fans
5	10" x 10" Supply and drain water chase
6	Compressors
7	Evaporator coils
8	4" Filters
9	Supply fans
10	Power return fans
11	Outside air louvers
12	Fluorescent lights
13	Return air dampers
14	Bar grates
15	Relief panel
16	Supply opening
17	Return opening
18	Incandescent vapor proof lights
19	Outside air dampers
20	Sump intake



UNIT SPECIFICATIONS

The Penthouse unit shall be Mammoth Custom Penthouse unit of the type, size, and capacity as required and listed in the equipment schedule. Each unit shall include the pre-assembled components in accordance with the following detailed specifications.

Construction

Cabinet

Each Penthouse unit shall be fabricated in one (1) or more sections ready for field installation. Each section shall be fabricated with a structural steel base reinforced and braced to permit the shipping and general handling of the completed section without damage to the section or internal components. The section base shall be fabricated with an 8-inch, 11.5 lb. per foot, structural member perimeter and have 8-, 11-, and 14-gauge formed structural cross members at 30" centers maximum. Additional cross members or reinforcements shall be placed at critical locations to support internal components. The base section shall have a floor of 14-gauge galvanized steel, insulated with 4-inch, 1 1/2 lb. density fiberglass insulation and a 1/2" blanket type, dual-density construction insulation providing acoustical sound absorption capabilities. The insulation shall be retained on the underside by hardware cloth. Lifting points for the section shall be part of the section base.

The section exterior wall structure shall be fabricated of formed 11- and 14-gauge members. The exterior siding shall be 22-gauge pre-painted galvanized steel fabricated and assembled to provide an embossed exterior surface. The wall shall be insulated with 4-inch, 1 1/2 lb. fiberglass insulation for minimum "R" value of 16.3. The interior surface of the wall shall form the air seal and shall be fabricated from 20-gauge galvanized steel. No exposed insulation shall be permitted in the air stream. Felt back or rigid board exposed stick-on insulation will not be permitted.

The top frame structure shall be fabricated of 11- and 14-gauge steel. The interior surface shall form the air seal and shall be fabricated from 20-gauge galvanized steel. The roof shall be insulated with 4-inch, 1 1/2 lb. density fiberglass for minimum "R" value of 16.3. The roof exterior shall be constructed of 18"-wide roll-formed panel, of 24-gauge galvalume material with 2 1/4" standing seams. The roof shall be sloped a minimum of 2°.

Sections shall be designed to be joined together by bolting through mating frame structure. The section frame shall be completely prime painted after fabrication to prevent rusting.

Service Vestibule

Each unit shall be provided with a full-height, internal walk-in service corridor. A double-wall insulated partition shall be used to separate the airflow equipment from the service corridor. The partition shall be fabricated with a 2" structural frame of 14-gauge galvanized steel, 20-gauge galvanized steel skins, and insulated with 2-inch, 1 1/2 lb. fiberglass insulation. The service corridor floor shall be constructed of 12-gauge treadplate.

Doors

The external access door(s), and service corridor access door(s) shall be fabricated with an outer skin of 18-gauge galvanized steel, an inner skin of 20-gauge galvanized steel and insulated with 2-inch, 1 1/2 lb. fiberglass insulation. The door shall have a continuous hinge mounted to a 12-gauge

door frame. A continuous vinyl bulb gasket shall seal between the door and frame. The access door(s) shall be secured with latches which are operable from both sides. External vestibule access door(s) shall be 36" x 75 1/4". Other access door(s) shall be 24" x 75 1/4". Internal access door(s) serving the airstream shall be provided with 6" x 6" sight ports.

DX Cooling

Compressors

The compressors shall be of the semi-hermetic, reciprocating type, operating at no more than 1750 RPM, refrigerant gas-cooled, with three-phase inherent overload protection, with voltage available at 460-480 Volts, and "UL" listed.

Lubrication is force-fed by a self-priming reversible gear-type oil pump to all crankcase surfaces through a fine mesh stainless steel oil strainer, with relief internal to housing conforming to ASHRAE/ANSI Code. A 350-Watt crankcase oil heater shall be supplied to maintain oil temperature during shutdown periods. Tight-sealing suction and discharge stop valves are seal cap-type with pressure taps and sweat-type flanged adapters.

Capacity-reduction is accomplished by an oil pressure-actuated cylinder unloading solenoid valve located on compressor crankcase cover plate. Solenoids are controlled by Mammoth factory controls with all compressors capable of four steps of capacity control.

Compressors are tested at 330 PSI with the discharge side further tested to 450 PSI and charged with oil and R-22 to assure a sealed and dry system before final field connections are made.

Evaporative Condenser

The evaporative condenser coils shall have all prime surface staggered copper tubes, copper headers, and ABS tube sheets to allow for expansion and contraction while avoiding galvanic corrosion. A subcooler integral to the condenser coil shall provide a minimum of 10°F liquid subcooling. The coils shall be factory leak tested at 400 PSIG nitrogen under water.

The sump shall be constructed of welded 14-gauge type 304L stainless steel below water level and 20-gauge type 430 stainless steel above water line. The sump shall be equipped with a non-mechanical electronic water level control with a brass solenoid valve in the fill line for positive shutoff. A manual 2" brass drain valve, and electric pipe heating cable shall be provided.

The water circulating pump shall be a close coupled, bronze fitted centrifugal type with mechanical seal. Pump suction and discharge lines shall have flexible connections. A type 304 stainless steel pump suction strainer shall be provided which is easily removed for cleaning. The spray header shall be PVC with non-clogging brass spray nozzles, which thoroughly wet all coil surfaces to give maximum heat transfer and minimum scaling. An automatic, factory-set, field-adjustable sump water bleed shall be provided. Units shall be factory piped and tested, ready for 1 1/4" supply water and 2" drain line hookup.

Evaporator

The direct expansion evaporator coils shall be fabricated from staggered 1/2" O.D. x .017 wall seamless copper tubing expanded into plate-type aluminum fins to form a positive mechanical and thermal bond. The fins shall have full drawn collars to completely cover the copper tubes. They shall be factory leak tested at a minimum of 400 PSIG under water. Evaporator coils shall be provided with thermostatic expansion valves equipped with external equalizer lines and adjustable for superheat. Refrigerant shall be fed to the coil circuits by brass distributors.

Each evaporator coil shall be provided with a drain pan which shall be fabricated of galvanized sheet steel and coated with corrosion resistant mastic material, which shall be fire resistant (shall meet wet flammability per ASTM D93-73 and dry flammability per ASTM E84-70), provide vibration dampening and thermal insulation. The drain pan(s) shall extend beyond the leaving side of the coil and underneath the cooling coil connections and shall have a common threaded condensate drain connection extending through the unit base frame.

Refrigerant Circuits

The refrigerant circuits shall be multiple independent circuits which shall be factory piped, tested, dehydrated and fully charged with oil and refrigerant R-22 (holding charge only). Field connections are required between sections. Each refrigerant circuit shall include liquid line service and charging valves, removable core filter drier, sight glass, liquid line solenoid valve, suction and discharge line check valves and compressor service valves.

Supply Air Fans

Airfoil Fans

The fan wheels shall be multiple airfoil, single width/single inlet-SAS type, secured to a machined, ground and polished solid steel shaft. The shaft shall be coated with a rust inhibitor and shall be supported by two outboard bearings. The fan assembly shall be dynamically balanced. Bearings shall be of the self-aligning ball bearing pillow block type and shall be designed for a minimum of 200,000 hours average life. Drive shall be by means of multiple V-belts. Motor and fan assembly shall be mounted on a heavy-duty steel frame supported by springs with 1-inch deflection (2-inch deflection available).

Variable Air Volume – Varicone®

The unit shall be capable of delivering a variable air volume by means of a conical spun-steel disk which slides through each fan inlet cone to modulate air flow from 100% open to a tight shut off. The disk is mounted on a rigid stainless steel sleeve with graphite impregnated bearings between it and the fan wheel shaft. Neither the sleeve assembly nor the control disk rotate. Position control is attained by the use of a non-binding ball-and-screw activator.

Outside And Return Air Dampers

Dampers are mounted within a 14-gauge galvanized die-formed channel. The construction of the airfoil shaped blade is of extruded aluminum double wall, with a 1/2 inch, 16-gauge plated square tube axle, keyed into the 12-gauge screw compression pivot arms. Cross linkage rails are fabricated from

12-gauge galvanized 1 1/4 x 1/4 inch angle. Pivot bearings 3/4 x 3/16 inch plated steel. The axle bushings shall be injected molded from delrin. All blade edges are extruded with inflatable lip, fully operational in ambient conditions ranging from -50° F to 275° F. The leakage rate shall be 1.90 CFM at 1.0 (inches WC) to 5.2 CFM per each square foot of damper area at 4.0 (inches WC) static pressure across blade surface.

Outside Air Intake Louvers

Outside air louvers shall be of a storm-proof design and shall be provided with 1/2" x 1/2" galvanized bird screen. A fully insulated divider shall be provided to separate outside air from return air.

Power Return/Exhaust Fans

Airfoil Fans

The fan wheels shall be multiple airfoil, single width/single inlet-SAS type secured to a machined, ground and polished solid steel shaft. The shaft shall be coated with a rust inhibitor and shall be supported by two outboard bearings. The fan assembly shall be dynamically balanced. Bearings shall be of the self-aligning ball bearing pillow block type and shall be designed for a minimum of 200,000 hours average life. Drive shall be by means of multiple V-belts. Motors shall be heavy-duty open drip-proof, three-phase, 1800 RPM, mounted on a heavy-duty sliding base. Motor and fan assembly shall be mounted on a heavy-duty steel frame supported by springs with 1-inch deflection (2-inch deflection available). Exhaust air discharge through a non-motorized, fully-insulated gravity relief panel.

Propeller Exhaust Air

Propeller exhaust fans shall each have six die-formed blades welded to a steel hub assembly. Gussets which extend three-quarters of the blade length are welded to the blades to reinforce, strengthen and prevent twisting and loss of shape under load. Each fan shall be belt-drive. Shaft bearings are pillow block type. An exhaust air non-motorized backdraft damper shall be supplied with each fan.

Filters

The units shall be provided with filters installed in a galvanized steel filter rack. The filters shall be 4-inch 30% efficiency (ASHRAE 52-76 Standards) throwaway type. The filters shall be provided with easy access for insertion and removal.

Unit Main Disconnect Switch

The unit shall be furnished with a molded case switch (non-automatic circuit breaker) to disconnect the power supply. The design shall incorporate a switch handle to permit unit disconnect without opening the control panel doors.

Main Control Panel

The main control panel shall have an access door for direct access to the controls. The panel shall be equivalent to NEMA type 3R (rainproof) and shall contain a single, externally operated, molded case switch (non-automatic circuit breaker) suitable for copper wire up to and including 3-inch conduit. Wire and conduit entrance shall be inside of unit curbing. The main control panel shall include the following:

1. A power terminal block.
2. A power transformer with 115-Volt secondary transformer and 115-Volt circuit breakers.
3. A 24-Volt control transformer and circuit breakers.
4. Necessary relays.
5. A 115-Volt terminal strip.
6. A 24-Volt terminal strip which shall contain wired terminals for all controls, numbered in accordance with the wiring diagram.
7. An isolated 24-Volt field wiring terminal strip.
8. An electric print pocket which in addition to the electric print shall contain a pre-startup form, a startup form and maintenance instructions.

The above components shall be in addition to electrical components associated with other sections, which shall be incorporated in the main control panel to facilitate maintenance and trouble shooting. All components shall be identified with name tags and wired in accordance with National Electric Code.

Temperature SST Controls, Variable Air Volume (VAV) Cooling

Each unit shall be furnished complete with all operational controls. All controls in the basic control package shall be factory installed and wired. The control system shall be a solid state integrated system consisting of a master control sequencer, a discharge air temperature sensor, and a 24-Volt control transformer. The discharge air sensor shall have a

platinum resistance-type element which shall sense average discharge air temperature and send a ramp signal to the master control sequencer. The master control sequencer shall accept the signal and initiate stages cooling in proper sequence to maintain a constant discharge air temperature. The master control sequencer shall provide a variable time delay between cooling stages to prevent compressor short cycling.

The economizer control system shall include a modulating spring return, outside air/return air damper actuators, and an enthalpy/sensible changeover control. The enthalpy/sensible changeover control shall determine the capability of the outdoor air to provide free cooling. On a call for cooling, the master control sequencer shall modulate the economizer damper actuators to maintain the discharge air temperature at the effective set point. If this does not meet the space demand, the discharge air sensor shall cause the master control sequencer to energize the required amount of mechanical cooling. The economizer cycle shall allow only enough outside air to maintain the discharge air conditions. If the ambient conditions rise above the enthalpy/sensible changeover control set point, the economizer shall return to the minimum outside air position. The economizer shall have a minimum position potentiometer mounted in the economizer damper actuator.

Remote Status Panel

A remote light indication room panel shall be supplied with each unit. The remote panel shall be supplied complete with the following:

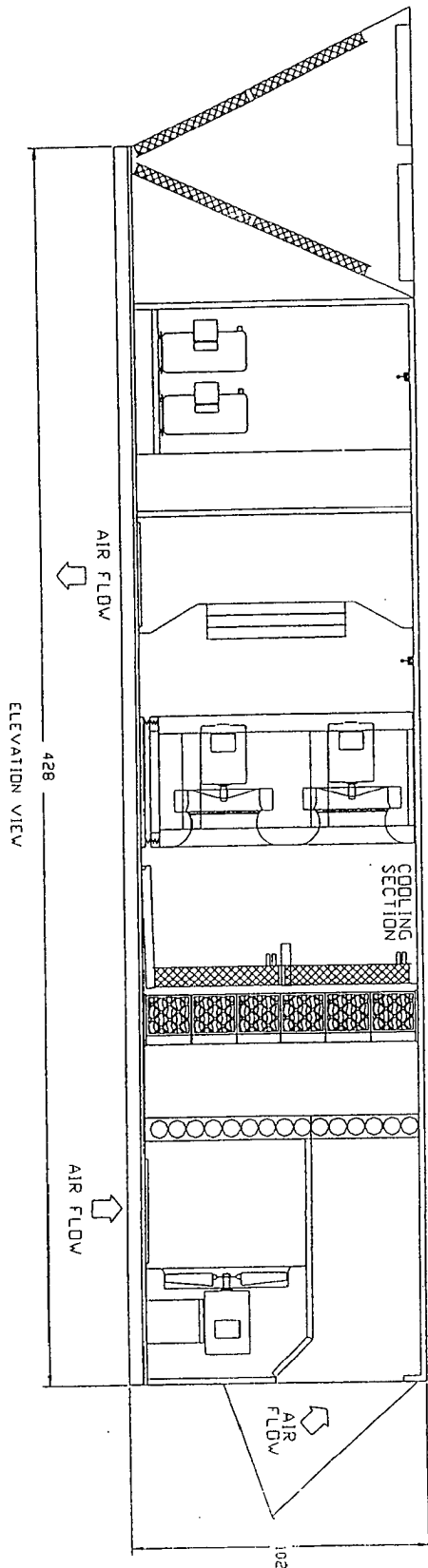
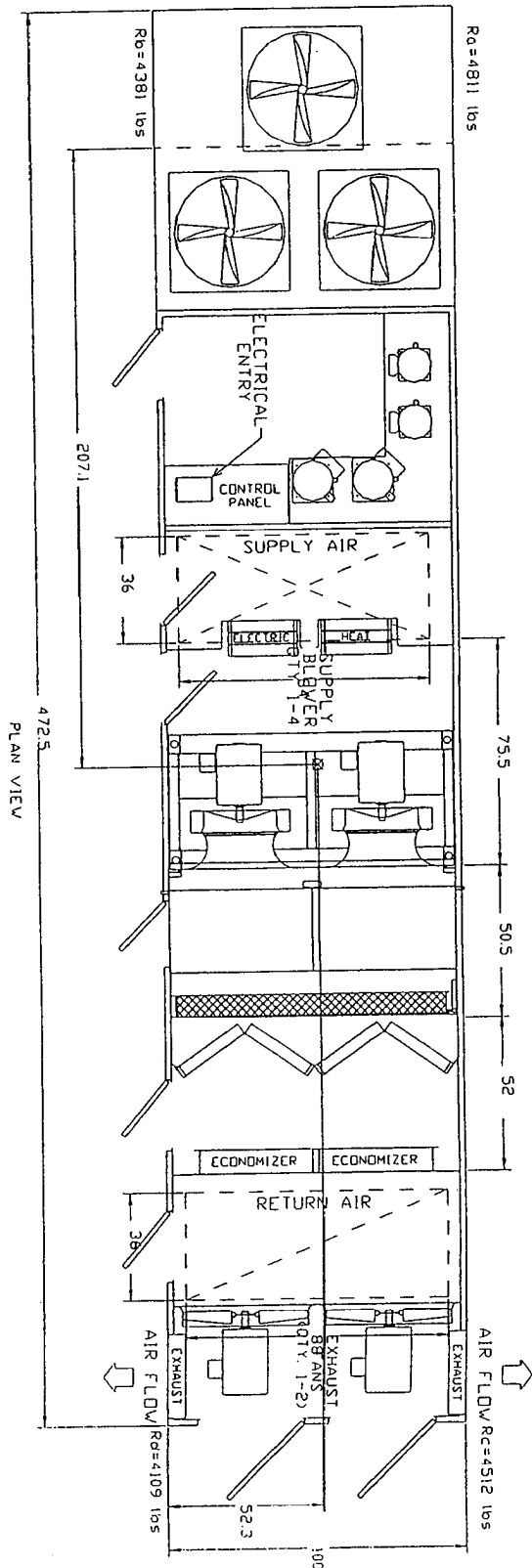
1. Fan-on light
2. Cooling-on light
3. High head pressure failure light
4. Low suction pressure failure light
5. Oil pressure failure light
6. Service (change out) filter light

ES-3-CPH-292
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AAON inc.

TULSA OKLAHOMA

Total Weight: 17812 / Shipping Weight: 17812

Configurator: RL-09S-3-0-AA02-131:BDAD-D00-CAE-AA00-00000000-00-00000000B

JOB NAME: TYPICAL DRAWINGS TO SHOW FEATURE OPTIONS

PURCHASER:

PURCHASE ORDER:

Rep Contact: NOT FOR JOB USE.

Ordered By: USE ECAT PROGRAM

UNIT TAG: RTU# 3

SERIAL NO.:

DATE: 02/04/2002

Engineer:

H 001926